



Loureiro Engineering Associates, Inc.

RCRA RECORDS CENTER
FACILITY MacDermid
I.D. NO. CTD 001164599
FILE LOC. R-13
OTHER RDMS# 160192

November 22, 2002



RDMS DocID 00100192

**United States Environmental Protection Agency
New England Region
Office of Site Remediation and Restoration
1 Congress Street, Suite 1100 (HBT)
Boston, MA 02114-2023**

Attn: Ms. Carolyn Casey

**Re: Conceptual Site Model and Work Plan
MacDermid Incorporated
526 Huntingdon Avenue, Waterbury, Connecticut**

Dear Ms. Casey:

On behalf of MacDermid Incorporated, Loureiro Engineering Associates, Inc. (LEA) has prepared this letter and associated attachments in response to your July 22, 2002 email containing comments to the *Conceptual Site Model (CSM) and Screening Levels* prepared by LEA and dated May 2002. LEA prepared this document in support of MacDermid's participation in the Voluntary Corrective Action Program (VCAP).

Also included with this letter are the *Documentation of Environmental Indicator Determination (EID)* forms for *Current Human Exposures Under Control (CA-725)* and *Migration of Contaminated Groundwater Under Control (CA-750)*. The EID forms are supported by drawings, figures, tables and historical documentation, which are appended to each EID.

As discussed during recent telephone communications, this letter is being submitted in lieu of a revised CSM. The EPA comments, which were sent via email *Draft* to MacDermid on June 26, 2002 and final on July 22, 2002, are presented below. Following each EPA comment are MacDermid's responses that have been prepared by LEA.

General Comments

1. All depth to water measurements for all wells should be summarized in a table and provided to EPA. MacDermid claims that the depth to groundwater is approximately 30 feet below grade but there has been no data provided to support that claim.

LEA Response: On Page 2-2 of the CSM, LEA states that based on information provided in the May 23, 2001 "RCRA Corrective Action Stabilization Report", depth to groundwater beneath the Site is approximately 33 feet below grade. LEA collected groundwater data during



United States Environmental Protection Agency

November 22, 2002

Page 2 of 9

implementation of the work plan and depth to water measurements collected during field activities are presented in the attached EID forms. The following table summarizes depth to groundwater measurements collected by LEA prior to initiation of the work plan, confirming depth to water beneath the developed portions (Site buildings) and majority of the Site as between 25 and 34 feet below grade. Note that MW-101 and MW-102 are located near the former sludge disposal area across Huntingdon Avenue to the North of the Site. It should also be noted that MW-101 was installed into the bedrock and is not in the same water-bearing unit as the other wells on Site, resulting in a substantial difference in groundwater elevation.

Monitoring Well	Depth to Groundwater (feet below grade) July 10, 2002	Depth to Groundwater (feet below grade) July 30, 2002
MW-101 (MAC-6)	2.46	5.42
MW-102 (MAC-5)	25.56	25.75
MW-103 (GZ-2)	30.55	31.01
MW-104 (MAC-7)	19.43 (Well obstructed.)	Well obstructed.
MW-105 (GZ-7)	31.86	32.39
MW-106 (MAC-4)	Abandoned/destroyed.	Abandoned/destroyed.
MW-107 (MAC-3)	Abandoned/destroyed.	Abandoned/destroyed.
MW-108 (GZ-9)	32.60	Product, did not measure.
MW-109 (GZ-8)	32.25	31.87
MW-110 (MAC-1)	Could not locate.	32.63
MW-111 (GZ-6)	31.28	31.71
MW-112 (GZ-3)	31.71	31.78
MW-113 (GZ-5)	33.85	34.27

Further, an attempt was made to identify the screened interval in each well. However, with one exception, those wells in which the screened interval is unknown are either destroyed or obstructed (i.e. MW-104, MW-106 and MW-107). The screened interval of monitoring well MW-110 is unknown based on a review of historical data. LEA attempted to determine the screened interval of this well; however, exploratory techniques were unsuccessful in confirming depth of screened interval in this well.

2. The plan should separate the work that is proposed to meet the two EIs and separate the two screening level processes proposed to determine if each of the two EIs have been met. Different screening criteria should be used for the HEC EI than the GWRC EI.

LEA Response: *The work plan has been revised to reflect the use of different screening criteria for the Human Exposures Under Control (HEC) EI and the Groundwater Exposure Under Control (GWRC) EID. The amended screening level processes are addressed in applicable comments and responses in this letter.*



United States Environmental Protection Agency

November 22, 2002

Page 3 of 9

Specific Comments

Section 4.1.2 Indoor Air

3. Please clarify why "...there is no potential pathway for the volatilization of contaminants in Site soil into surrounding air." Contamination in site groundwater is likely from an initial release to soil. Although volatile organic compounds were only detected in soils that are not beneath buildings, there are several AOCs within the building that have not been adequately addressed. For example, no soil samples have been collected in the immediate vicinity of AOC-G, the hazardous waste storage area, or in some areas within AOC-D (pilot plant/main mixing area) and AOC-E (former lagoons/WWTS/bulk waste unloading and storage/copper etchant recycling and spill area/acid tank farm). Since these soils are beneath buildings and as long as the buildings remain in place there is no direct exposure risk, but this does not address a potential indoor air inhalation risk. Even if groundwater is 30 feet below grade, volatilization from contaminated soils may create an indoor air risk.

LEA Response: Volatilization of contaminants in groundwater is unlikely because depth to groundwater measurements indicate groundwater is approximately 26 feet below grade to 34 feet below grade. The potential human pathway in this instance would involve volatilization of contaminants from impacted groundwater into the vadose zone, migration through the soil column and the concrete floor and into indoor air space and inhalation by the receptor. Based upon this information, the pathway for indoor air is not considered complete. Nonetheless, an assessment of groundwater quality and potential human inhalation exposure was conducted by comparing the groundwater sampling data to the Connecticut Remediation Standard Regulations Residential Volatilization Criteria for off-site residents and the Industrial/Commercial Volatilization Criteria for on-site workers.

4. Table 1 and figure 2 do not show that an indoor air screen is needed or will be completed for the off-site resident, yet this paragraph states that it will be done. Conversely, this section does not discuss an indoor air screen for workers on-site yet table 1 and figure 2 indicate the screen is needed and will be completed for this receptor. Please revise as appropriate so that the figures and text create a clear picture of the potential receptors and screening level process. Evaluation of the indoor air pathway is needed for both of these receptors.

LEA Response: A groundwater contour map was generated for the Site that indicates that groundwater beneath the Site does not flow toward the off-site residences, and therefore the residences are not considered a risk of exposure the contamination in the groundwater. Also, as presented in question 3 of the HEC EI it is our belief that this exposure pathway is not present because the only possible scenario for volatilization is from groundwater and, based on depth to groundwater (i.e. ~30 feet), it is unlikely that exposure pathways are complete.



United States Environmental Protection Agency

November 22, 2002

Page 4 of 9

Section 4.1.3 Surface Water

Page 4-2

5. It is not clear if this section is proposing to compare surface water sample results to the Surface Water Protection Criteria (SWPC) or to the lower of the aquatic life or human health protection criteria (CTDEP Numerical Water Quality Criteria) mentioned in the second paragraph of this section. Table 1 does not provide any further clarification. Although it is obvious that some of the RSR SWPC are 10 times the lower of the aquatic life or human health criteria this is not always the case, particularly for VOCs.

It would not be an appropriate or necessarily "a conservative evaluation" to compare surface water analytical results to the SWPC. These criteria are for screening groundwater for the protection of surface water. Please provide clarification and/or appropriate screening levels.

LEA Response: Based on our recent communications, LEA will first complete a comparison of groundwater sampling data with the United States Environmental Protection Agency Maximum Contaminant Levels (MCL) to assess potential human exposures as discussed in the HEC EI.

Groundwater sampling data will then be compared to the Surface Water Protection Criteria (SWPC) to determine if there is potential for impact to surface water from site groundwater as discussed in the GWRC EI. LEA maintains that potential contributors between the site and rivers would skew surface water sampling data.

Page 4-3

6. The first paragraph states that "...an evaluation of groundwater quality leaving the Site is necessary first to determine if a potential impact from contaminated groundwater discharging to surface water is likely." This would be appropriate for meeting the EIs as long as no direct discharges still exist. For a final remedy, direct releases would also need to be considered; a determination of impact to the streams or sediments cannot be made based solely on a potential impact from contaminated groundwater. Documentation shows releases occurred directly to surface water via storm drains and the waste-water treatment system sewer.

LEA Response: Facility manufacturing operations have been discontinued with the exception of limited office work and product shipping and receiving. As such, no active direct discharges exist at the facility. In developing final remedy for the Site, direct historical releases will be considered and the necessity for surface water and sediment sampling will be evaluated at that time.



United States Environmental Protection Agency

November 22, 2002

Page 5 of 9

Section 4.1.5

Page 4-4

7. In the second paragraph, please clarify what the last sentence means and/or correct the typographic errors: "...detected consistently in sediment samples collected from on-site surface water samples..."

LEA Response: Correction made. "...collected from adjacent surface water bodies..."

8. The last paragraph in this section should discuss the "release assessment" and any remedy that may have taken place. The 1994 data shows elevated levels of copper in sediments (likely from the copper etchant release) and unless some remediation and post remediation sampling took place, additional evaluation/sampling is warranted at some point in the future. For the purposes of the EIs, this should at least be noted. Again, for a final remedy, basing the need for sediment and surface water sampling on groundwater discharges alone is not appropriate since other release pathways to surface water existed.

LEA Response: The 1994 release assessment completed by HRP Associates included collection of eighteen sediment samples including two upstream of the discharge. The sediment samples were analyzed for copper, nickel, lead, and zinc. The results of the assessment indicate that concentrations of metals were generally highest at the point of discharge into Steele Brook with declining concentrations further downstream. Two exceptions are the concentrations of nickel and zinc, which were greater in sediment samples collected upstream in the Naugatuck River in comparison to those collected at the point of the release. No information has been identified that suggests remediation and/or post-remediation sampling was conducted.

Table 1

9. The Work Plan should be perfectly clear as to which criteria are being used for screening each media. For sediment, the table states that a comparison will be made to site screening levels yet "site screening levels" has not been defined. Also, for surface water screening, the table states that surface water and groundwater results will be compared to the CTDEP RSR. Please clarify by listing the specific RSR criteria.

LEA Response: Table has been revised (and attached to EID forms) to define the particular criteria to which data will be compared (i.e. Residential Volatilization Criteria, Surface Water Protection Criteria).

10. Screening surface water data against the CTDEP SWPC for groundwater is not appropriate to evaluate an off-site sampler or recreator's dermal/incidental ingestion risk. The SWPC are for screening groundwater for the protection of surface water and have a dilution factor applied to account for dilution of contaminants in groundwater prior to reaching the surface



United States Environmental Protection Agency

November 22, 2002

Page 6 of 9

water body. The Maximum Contaminant Levels would be appropriate and conservative numbers to use for an initial screen for dermal risk.

LEA Response: *The Maximum Contaminant Levels were used for the initial screen for dermal risk. This is reflected in the attached revised Table 1.*

11. Under indoor air inhalation, residents and not excavating laborers should have a "YES" for this pathway.

LEA Response: *As discussed in question 3 of the Human Exposures EI, off-site residents are not believed to be at risk of an exposure based upon the direction of groundwater flow and the depth of groundwater at the Site.*

Figure 2

14. Some of what is provided here conflicts with what is presented in Table 1. For example, the adult recreator should have a pathway to surface water and sediment, not surface soil. An indoor worker also has an exposure to surface soil as shown in Table 1.

LEA Response: *Figure 2 has been revised to eliminate ON-SITE adult recreator, based on recent telephone correspondence between LEA and EPA. The revised figure is attached to this letter.*

15. Please provide the distinction between an indoor worker and maintenance worker or delete one of the two.

LEA Response: *Correction has been made to eliminate maintenance worker.*

16. The off-site resident should also have a pathway for indoor air.

LEA Response: *LEA disagrees that a potential exists for inhalation of volatilized contaminants by off-site residents based on the types of contaminants, significant depth to groundwater, and groundwater flow direction; however, the maximum concentrations of constituents of concern detected in groundwater will be compared to the Residential Volatilization Criteria of the Connecticut Remediation Standard Regulations to provide an evaluation of the potential risks to off-site residents.*

Drawing 1

17. Unusual abbreviation should be spelled out (e.g., compounds detected in groundwater- ACT, SBBZ, MCM).

LEA Response: *An expanded legend has been added to the drawing and is included with the*



United States Environmental Protection Agency

November 22, 2002

Page 7 of 9

EID forms.

18. Units of measurement should be provided for the contaminant concentrations shown here for groundwater and soil.

LEA Response: *An expanded legend has been added to the drawing and included with the EID forms.*

**Technical Review of the Voluntary Corrective Action Program Work Plan
MacDermid Incorporated
526 Huntingdon Avenue Waterbury, CT**

General Comments

1. A previous proposal included the installation of 6 monitoring wells and 2 piezometers. Have these wells and piezometers been installed and if not, why aren't they included in the current proposal? In addition, EPA previously discussed with MacDermid the need for better monitoring well coverage along Gear street, between the facility property and the adjacent residential properties. Please clarify why no additional wells are proposed for installation along Gear Street and/or explain how the off-site indoor air pathway will be adequately evaluated.

LEA Response: *The previous proposal was submitted by HRP Associates, Inc. and detailed their approach to stabilization at the site. LEA has proposed to first complete an evaluation of groundwater sampling data and groundwater flow direction. The evaluation of data will include a comparison to the Connecticut Remediation Standard Regulations Residential Volatilization Criteria to evaluate the off-site indoor air pathway. The data will be used in conjunction with an assessment of groundwater flow direction which will be used to determine the potential for migration of site groundwater onto nearby residential properties.*

2. Several comments contained in EPA's February 11, 2002 letter have not been addressed either with a written response or as work proposed within the work plan. The following are some general and specific examples:

Numerous comments regarding inaccurate or incomplete data summary tables.

General comment 9 - Soil contamination should be included as a data gap for many AOCs because either no data exists or very limited data exists (one sample in many cases). Although a pathway may not exist for some of these AOCs as the areas are covered w/pavement or buildings, without the history of a unit (have the floor trenches always discharged to the WWTS and have they always been epoxy coated?), the data gaps still exist. For example, at AOC-D: concrete trenches are not impermeable and are



United States Environmental Protection Agency

November 22, 2002

Page 8 of 9

often times the source of sub-slab soil contamination, particularly those that may remain wet for periods of time due to the nature of the processes. Other examples include AOC-A, AOC-F, AOC-K.

LEA Response: *LEA's understanding based on our recent communications is that sampling is not warranted in areas where a direct exposure pathway does not exist or exposure to media is controlled (i.e. beneath a concrete floor).*

Additional comment 11 - Again, it is necessary to obtain information on the use of water supply wells, industrial water supply wells and remediation wells to evaluate potential exposure routes, potential human health impacts and to evaluate any potential effects on groundwater and contaminant migration that pumping these wells may have.

LEA Response: *Information pertaining to the use of water supply wells, industrial supply wells and remediation wells has been included with the EID forms. LEA incorporated the well survey information completed by HRP Associates, Inc. as well as completed a windshield survey to determine location and use of water supply wells in the area.*

Any additional field work that is needed should, at a minimum, be reflected in a revised schedule. Revised data summary tables should be included in the EI documentation.

LEA Response: *Any changes to the proposed work plan will be reflected in an updated schedule.*

3. Please submit the surface water and sediment sampling SOPs for review prior to conducting any such sampling.

LEA Response: *These documents were not submitted since sediment and surface water sampling were not proposed unless results of groundwater sampling suggested that impact to these media is a possibility.*

4. Surface water and sediment samples should be collocated. The schedule shows that these are two distinct sampling events with surface water sampling starting 3 days after sediment sampling.

LEA Response: *If surface water and sediment sampling is conducted, sampling will be conducted simultaneously. If necessary, revision to the schedule will be made and submitted.*

5. Additional information is needed regarding the surface water and sediment sampling (e.g., what measurements will be taken in the field and what are the constituents of concern?)



United States Environmental Protection Agency

November 22, 2002

Page 9 of 9

LEA Response: If surface water and sediment sampling is conducted, this information will be included in an updated sampling plan.

We trust this information addresses your comments. If you have any questions regarding this project, please do not hesitate to contact me directly at (860) 747-6181.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

Kimberly M. Clarke
Project Manager

Attachments

CC: Mr. Troy Charlton, MacDermid Incorporated
Mr. Richard Nave, MacDermid Incorporated